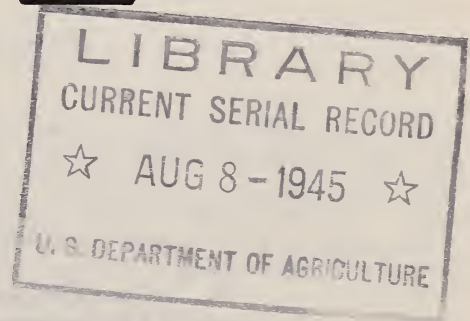


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INCREASING INCOME THROUGH RANGE CONSERVATION AND LIVESTOCK IMPROVEMENT



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INCREASING INCOME THROUGH RANGE CONSERVATION
AND LIVESTOCK IMPROVEMENT¹

by
D. S. Hubbell and J. L. Gardner

INTRODUCTION

Increased production of beef, mutton, and wool for war-time needs as well as for peace-time markets must be obtained through efficient production and not through the destructive expansion of agricultural activities. The goal of sufficient food production must be reached, but not at the expense of our basic agricultural resources.

The long-time view is important, since, as experience has shown, once the range has deteriorated through overuse or been broken for emergency crop production, it is difficult or sometimes impossible to restore to economical stock production. The alarming tendency of ranchers and farmers to add more livestock to already overburdened ranges and to break out more range land results from a sincere but dangerous effort to increase food production. It must be realized before it is too late that abuse of the range lands and of the cultivated soil will ultimately decrease rather than increase production.

The purpose of this bulletin is to give ranchers an opportunity to study and evaluate the facts and figures gathered from eight years of demonstration of proper range conservation and livestock management. Unless the agricultural mistakes of the last war are avoided, we shall again be faced with the dust storms and other forms of soil devastation which have plagued the farmer and the rancher ever since.

The facts presented herewith will demonstrate that food and fiber production in the form of beef, mutton, and wool often can be increased with fewer livestock on the same amount of land.

1. Revision of Regional Bulletin No. 67, Evaluation Series No. 2, January 1, 1940

DESCRIPTION OF DEMONSTRATION AREA

In July, 1943, the Navajo Experiment Station at Mexican Springs, New Mexico, entered the tenth year of its research, experimental and demonstrational soil conservation program.

A pioneer testing ground in the earliest days of the organized soil erosion control movement, the Station has been the scene of a wide variety of research projects as well as of a livestock, range management, and farming demonstration program.



These cattle are feeding on a grazing unit which had 1,500 cow-days feed in 1934. When this picture was taken in 1939, 23,000 cow-days feed was available.

Grazing of livestock presents the most pressing land use problem in the Southwest. The Station's demonstration of the beneficial physical and economic effects of proper grazing and management practices together with livestock improvement is, therefore, important to the program of increased production of livestock in the region.

The demonstration area is a small but almost complete watershed, and is perhaps as typical of northwestern New Mexico as any one site could be. It comprises 43,000 acres, and ranges from an elevation of 6,200 feet in the lower, eastern portions to 8,120 feet on the high, western watershed divide. Average annual rainfall in the lower portions is 9.5 inches, while in the upper reaches it is 17.5 inches.

Owing to a high percentage of foothill and mountain topography, shallow residual soils, and deeply-filled alluvial valleys, the area as a whole is rather susceptible



These sheep are utilizing a grazing unit which had 57,000 sheep-days feed in 1934. At present, there are 72,000 sheep-days feed available.

to severe water erosion. Since this is characteristic of much of the Southwest, range control methods tested here have been found applicable in many other parts of the region.

THE DEMONSTRATION

Since the primary object of the Station was research in soil and water conservation, the prevailing overgrazed condition of the range had to be remedied if such research was to produce results. At the same time, it was necessary that the area maintain the income of the people living on it if these results were to be applicable elsewhere. Accordingly, a livestock improvement and range management program was undertaken.



After eight years of protection from grazing, this gully has healed over with western wheatgrass.

The first step was a reduction to proper numbers of the sheep, cattle, and other stock grazing within the Station boundaries. After the area was fenced, therefore, all of the livestock was removed. Surveys showed the estimated carrying capacity to be 1,670 sheep units. This amount of stock was returned to the area. The program included both cattle and sheep, because it was felt that in an area of this size, with such a varied topography, several different combinations of grazing practices could be used to the best advantage.

Of the 1,670 sheep units returned to the area, 500 were purebred Rambouillets, and 500 were mixedbred or grade sheep; purebred Hereford cows made up 320 sheep units, and 350 sheep units were in miscellaneous stock such as horses, rams, and bulls.

In addition to records on the livestock within the area, similar information has been obtained on yields and returns from typical livestock outside the demonstration area. For comparing returns under proper management within the area with those under ordinary management outside, the former number of sheep units grazing the area was estimated to be 3,340. Improved breeding and culling were important factors in maintaining income while reducing the range burden.

Purebred sheep were grazed on the area during the time of the demonstration, beginning in 1935. A like number of grade sheep was introduced to the area at the same time. Improvement of the latter was begun in 1937. Although the period from 1937 to 1942 was not long enough for this improvement to achieve the highest possibilities in increased production, the results were gratifying, since at the end of the period the wool clip from the grades was approaching that of the purebreds. In 1935, the wool clips from the two classes of sheep were: purebreds, 12.5 pounds per head; grades 4.9 pounds. In 1942, the values were 10.5 pounds and 7.8 pounds per head, respectively.

Eight years of proper livestock management have shown that some of the people living within the demonstration area have been able to reduce the number of their livestock by half, run purebred sheep and cattle, and raise their level of income; whereas the rest of the ranchers have been able to reduce their livestock by half, improve the remainder, and maintain their level of income. Tables 1 and 2 show the results which have been obtained from purebred and grade sheep as compared with the prevalent management of grades.

Because of the expense involved, it is not expected that all ranchers will purchase all purebred sheep, since, according to the figures quoted above, by the use of careful breeding, production may be increased rapidly at very little additional expense. It has taken only five years of moderately careful breeding and selection for the grade herd to approach the level of production of the purebreds.

Returns from the cattle are shown in Table 3.

TABLE 1. Comparison of average yields from grade sheep and purebred Rambouillets, 1935-1943

| | Number of Ewes | Per cent ; lamb ; crop | Average ; fleece ; weight | Average ; lamb ; weight | Average ; per cent ; death loss |
|-------------------------------|----------------------|------------------------------|---------------------------------|-------------------------------|---------------------------------------|
| Grade sheep inside area | 500 | 80.8 | 5.7 lbs. | 57 lbs. | 5.4 |
| Grade sheep outside area | 500 | 64.5 | 4.6 lbs. | 54 lbs. | 13.2 |
| Purebred sheep inside area | 500 | 92.1 | 10.1 lbs. | 66 lbs. | 5.0 |

TABLE 2. Average returns from grade sheep and purebred Rambouillets, 1935-1943

| | Av. price wool per pound | Av. price lambs per pound | Av. gross return per ewe |
|-------------------------------|-----------------------------|------------------------------|-----------------------------|
| Grade sheep inside area | 21.4 ¢ | 7.4 ¢ | \$4.56 |
| Grade sheep outside area | 21.1 ¢ | 7.1 ¢ | \$3.30 |
| Purebred sheep inside area | 23.3 ¢ | 8.4 ¢ | \$8.06 |

TABLE 3. Comparison of average yields and returns from Navajo cattle of fair grade and purebred cattle. 1939-1943

| | No. of mature cows | Per cent ; calf ; crop | Per cent ; death ; loss | Av. calf ; weight ; | Av. price ; per lb. ; | Gross ; return ; per cow |
|------------------------------|--------------------------|------------------------------|-------------------------------|---------------------------|-----------------------------|--------------------------------|
| Purebred cows inside area | 50 | 90 | 1.1 | 457 lb. | 9.3 ¢ | \$38.92 |
| Grade cows outside area | 40 | 45 | 7.5 | 356 lb. | 7.8 ¢ | \$11.05 |

Since the demonstration area was about as big as a medium-sized ranch, the gross returns well may be considered on that basis. The average gross return for all kinds of livestock, after being converted to sheep units, was \$6.51 per unit; whereas the gross return per sheep unit on the outside of the area was \$3.30. These figures are based on 1,670 producing sheep units on the demonstration range. Because there has been little reduction in numbers of stock outside of the demonstration area as compared to a 50 per cent reduction inside, the income from one sheep unit inside must be compared with that from two sheep units outside.

The income from comparable areas inside and out, therefore, was essentially the same--\$6.51 on the inside and \$6.60 on the outside. In interpreting the long-range significance of these figures, however, it should be borne in mind that the range inside the area was improving, while that on the outside was rapidly deteriorating. Also, the extra expense and labor involved in handling the greater numbers of livestock on the outside tends to detract from the profit. Tables 1, 2, and 3 illustrate the effect on yield and return of proper livestock management.

Since many ranchers figure their returns on an acre basis, it might be well to reduce the above figures to that basis, not only for the actual returns, but also for the greatest possible maximum returns that might have been gained if a good grade of livestock had been used throughout the demonstration.

The results show that, under proper management, the demonstration area produced 19 cents per acre for the cooperators. Although each acre on the outside likewise produced 19 cents, the much greater number of livestock not only required considerably greater amounts of salt, water, and labor, but caused rapid deterioration of the range. The range in the demonstration area, on the other hand, was improving. If all sheep on the demonstration area had been of high quality, the acreage return would have been 21 cents, or 10 per cent more than that on the outside. Since high-quality animals have been unable to survive well on the excessively overgrazed ranges outside the demonstration area (determined by test and observations), the figures for the hardened grade sheep must be used for the comparison.

The recovery picture within the boundaries of the Station is equally as significant as the yield and return statistics. If it has done nothing else, the project has been worth-while alone for its demonstration of the value of proper grazing practices in erosion control. Gullies with little or no other treatment are healing on much of the area.



The animal-days feed in the experimental area to the left of the fence has been increased from 62,000 to 65,000 since 1934.

There is a striking fence line contrast at the top of the divide, where a fence marks the western boundary. Well-sodded western wheatgrass and blue grama slopes inside contrast sharply with bare, eroding soil outside, where the chief perennial vegetation is scattered clumps of snakeweed and pingue. Similar differences exist at the lower elevations, where galleta grass is the chief cover. There is evidence that the carrying capacity of the area has increased--possibly doubled--in portions of the higher rainfall belt and in flood-irrigated areas.



A hayfield under diversion flooding.

SUMMARY

Eight years of experience have demonstrated that western ranges can be improved and the level of income maintained by the use of good livestock and proper range management. The same methods are effective in conserving water and decreasing erosion.

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